

# INJURY UPDATE

A Report to Oklahoma Injury Surveillance Participants\*

May 31, 2012

## Heat-related Deaths in Oklahoma, 2011

In the United States, approximately 400 people die each year from extreme heat and 200 additional deaths occur with heat as a contributing factor. Heat-related illness includes conditions resulting from hyperthermia. These conditions range from heat cramps and heat exhaustion to heat stroke. Hyperthermia is a condition in which improper thermoregulation causes the body's temperature to increase. In the cases where hyperthermia was listed as a contributing factor, cardiovascular disease was the number one cause of death. Numerous factors inhibit the body's ability to cool itself during extremely hot weather. High humidity prevents sweat from evaporating quickly, subsequently preventing the body from quickly releasing heat. Other conditions that can limit the body's ability to regulate temperature include advanced age and young age (children ages 0-4), obesity, dehydration, fever, poor circulation, heart disease, sunburn, prescription or illicit drug use, and alcohol use.

According to data from the Oklahoma Office of the Chief Medical Examiner, 33 heat-related deaths occurred in Oklahoma from May to September 2011. Persons ranged in age from 3 to 91 years of age; the average age was 52 years. Deaths increased with increasing age. Eighty-two percent of persons were male and 18% were female. Among males, 67% were age 45 and older; 26% were age 65 and older. Among females, half of the deaths were among those 65 and older (Figure 1). Seventy-three percent of persons were white, 9% African-American, 9% Hispanic, and 9% Native American.

For cases with a known date of injury (26), the number of cases peaked during the week of July 31 to August 6. The weekly average high temperatures in central Oklahoma ranged from 77°F in May to 109°F in August (Figure 2).

Figure 1. Heat-Related Deaths by Age and Sex, Oklahoma, 2011

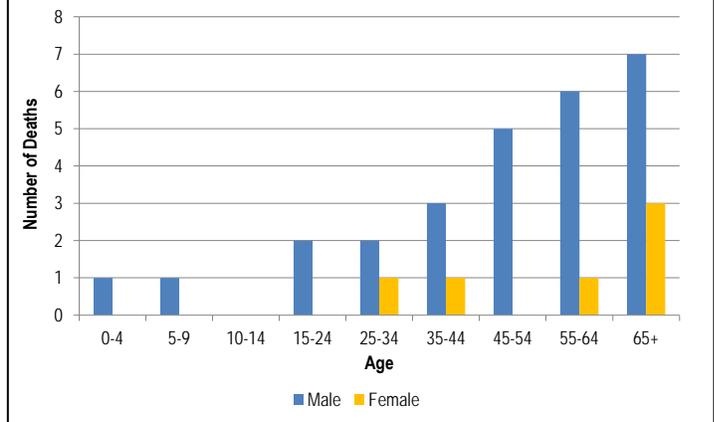
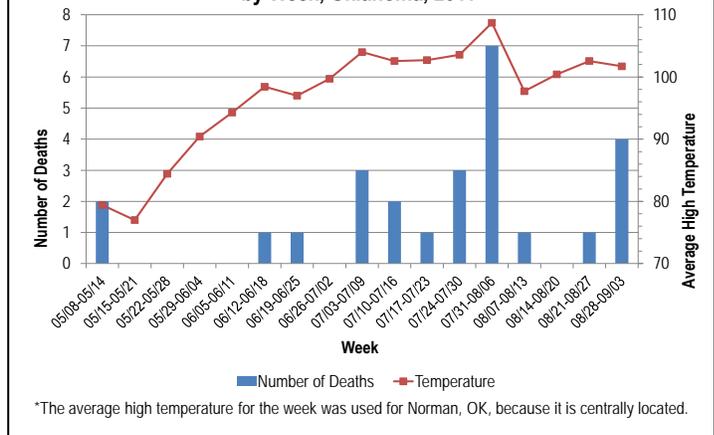


Figure 2. Heat-Related Deaths and Average High Temperatures\* by Week, Oklahoma, 2011



\*The average high temperature for the week was used for Norman, OK, because it is centrally located.



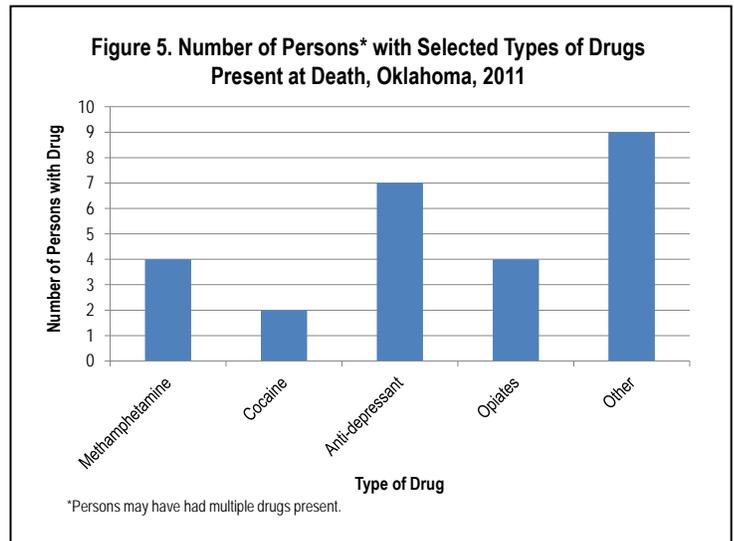
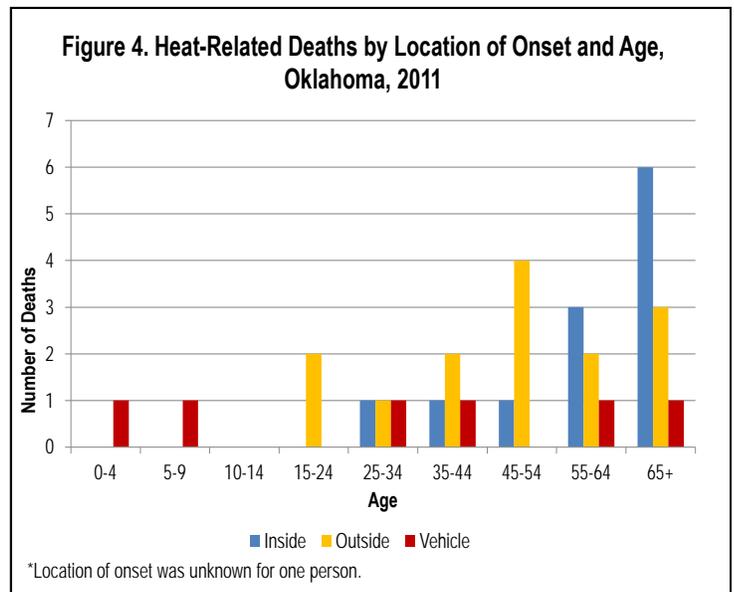
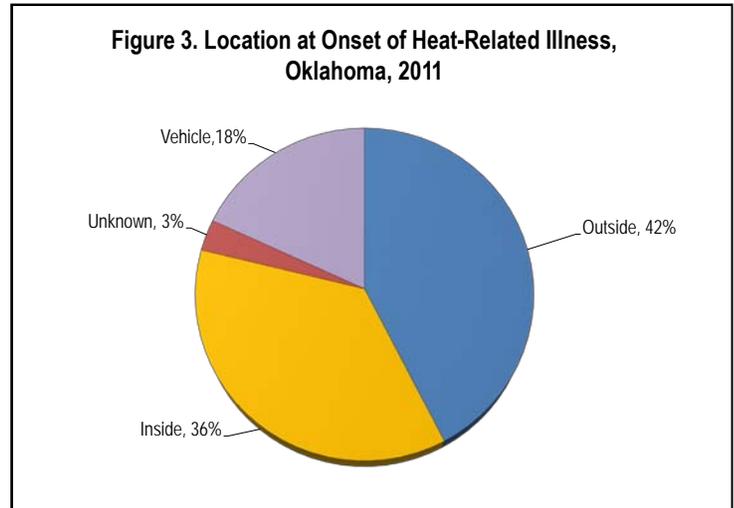
\*The INJURY UPDATE is a publication of the Injury Prevention Service, Oklahoma State Department of Health. This and other IPS information may be obtained from the Injury Prevention Service, Oklahoma State Department of Health, 1000 N.E. 10th Street, Oklahoma City, OK 73117, 405-271-3430 or 1-800-522-0204 (in Oklahoma). IPS publications are also available at <http://ips.health.ok.gov>.

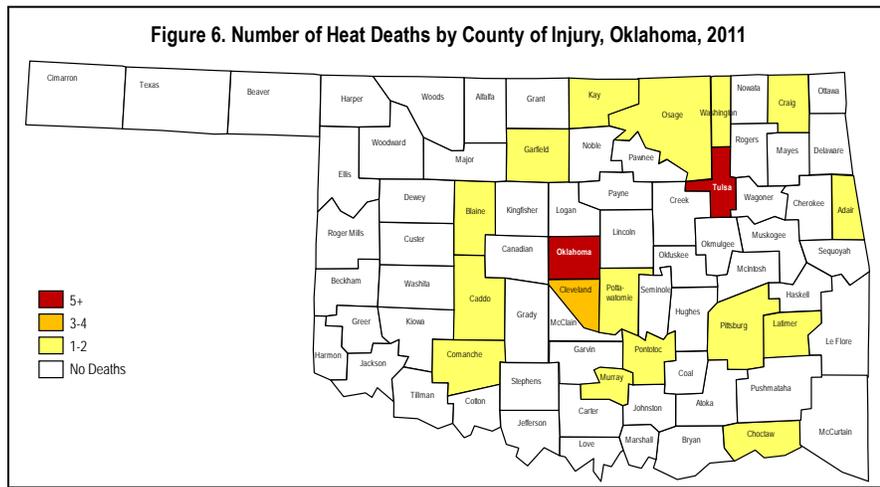
The location at onset of the heat-related injury was known for 32 cases. Forty-two percent were outside at onset of injury, 36% were indoors, and 18% were in vehicles (Figure 3). Five deaths were work-related. Two persons died while incarcerated. The majority (53%) of persons 55 and older were inside at the onset of injury (Figure 4).

Overall, 30% of persons tested positive for medications and/or illicit drugs (Figure 5). Chronic illnesses were present in 18 (55%) cases. Most of these people had more than one chronic illness. The most frequently occurring illnesses were hypertension (11), diabetes (8), and chronic obstructive pulmonary disease (5). Mental illness was present in 6 (18%) cases. According to body mass index (BMI) scores, 48% of adults who died were overweight or obese, 29% were normal weight, 10% were underweight, and the BMI was unknown for 13%. Oklahoma and Tulsa Counties recorded the highest number of deaths followed by Cleveland County (Figure 6).

**CASE BRIEFS**

- A child was found in the trunk of the family car after he had been missing for quite some time. It was unknown how long the child had been in the trunk.
- A middle-aged male working at a drilling rig site became sick. He went to a shaded area and collapsed. Paramedics were called and transported him to the emergency room where he died.
- A middle-aged female had been sunbathing. Her husband went to check on her and found her unresponsive. Paramedics were called and she was pronounced dead at the scene.
- An older adult male had been complaining of nausea and weakness to a family member. The family member was unable to contact him and called police to conduct a welfare check. Police found the decedent in his bed. There was no air conditioning in the residence.
- An older adult female had been complaining of dizziness, but would not allow her family to call paramedics. Paramedics were eventually called and found her in bed. The air conditioning in the residence had been broken for a week. Multiple fans were at the residence, but it was unknown whether or not they were being used.





**WARNING SIGNS AND SYMPTOMS**

**Heat Cramps**

- Muscle pains or spasms that occur usually in the legs, arms, or abdomen.
- They may occur during strenuous activity and can be a prelude to heat exhaustion.

**Heat Exhaustion**

- |                  |             |                      |
|------------------|-------------|----------------------|
| - Heavy sweating | - Tiredness | - Headache           |
| - Paleness       | - Weakness  | - Nausea or vomiting |
| - Muscle cramps  | - Dizziness | - Fainting           |

**Heat Stroke**

- |   |                       |                   |
|---|-----------------------|-------------------|
| - Body temperature above 103° F           | - Rapid, strong pulse | - Confusion       |
| - Red, hot, and dry skin with no sweating | - Throbbing headache  | - Unconsciousness |
|   | - Dizziness           |                   |
|   | - Nausea              |                   |

**PREVENTION**

- Stay in an air-conditioned place. If your home is not air-conditioned, visit the mall or public library, or contact your local health department to see if there are any heat-relief shelters in your area.
- NEVER leave anyone, especially children and elderly, in a closed, parked vehicle, even if the windows are cracked.
- Increase your fluid intake to two to four glasses (16-32 ounces) of cool fluids every hour. If you are on water pills or restricted fluid limit, consult your physician first.
- Avoid liquids that contain alcohol or large amounts of sugar; they cause you to lose more body fluid. Very cold drinks can cause stomach cramps and should be avoided as well.
- Wear lightweight, light-colored, loose-fitting clothing as well as sunscreen with a SPF 15 or higher and broad spectrum or UVA/UVB protection.
- Check on the following at-risk populations at least twice a day. Closely monitor them for warning signs.
  - o Infants and children
  - o People over 65 years of age
  - o People with a mental illness
  - o People who are physically ill, especially with heart disease or high blood pressure
- The Occupational Safety and Health Administration has a campaign to prevent heat illness in outdoor workers (<http://www.osha.gov/SLTC/heatillness/index.html>).